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[54] **COMPRESSION PAD FOR LAPAROSCOPIC/  
THORASCOPIC SURGERY**

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19462

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[52] U.S. Cl. .... **606/151; 606/127; 606/108**

[58] Field of Search ..... 606/127, 200,  
606/108, 151

- 5,254,133 10/1993 Seid .
- 5,304,187 4/1994 Green et al. .
- 5,342,370 8/1994 Simon et al. .
- 5,366,460 11/1994 Eberbach .
- 5,370,650 12/1994 Tovey et al. .
- 5,375,588 12/1994 Yoon .
- 5,387,224 2/1995 Semm .
- 5,391,141 2/1995 Hamilton .
- 5,395,383 3/1995 Adams et al. .
- 5,396,906 3/1995 Harrold .
- 5,397,332 3/1995 Kammerer et al. .
- 5,403,343 4/1995 Sugarbaker .
- 5,405,360 4/1995 Tovey .
- 5,417,684 5/1995 Jackson et al. .

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[56] **References Cited**

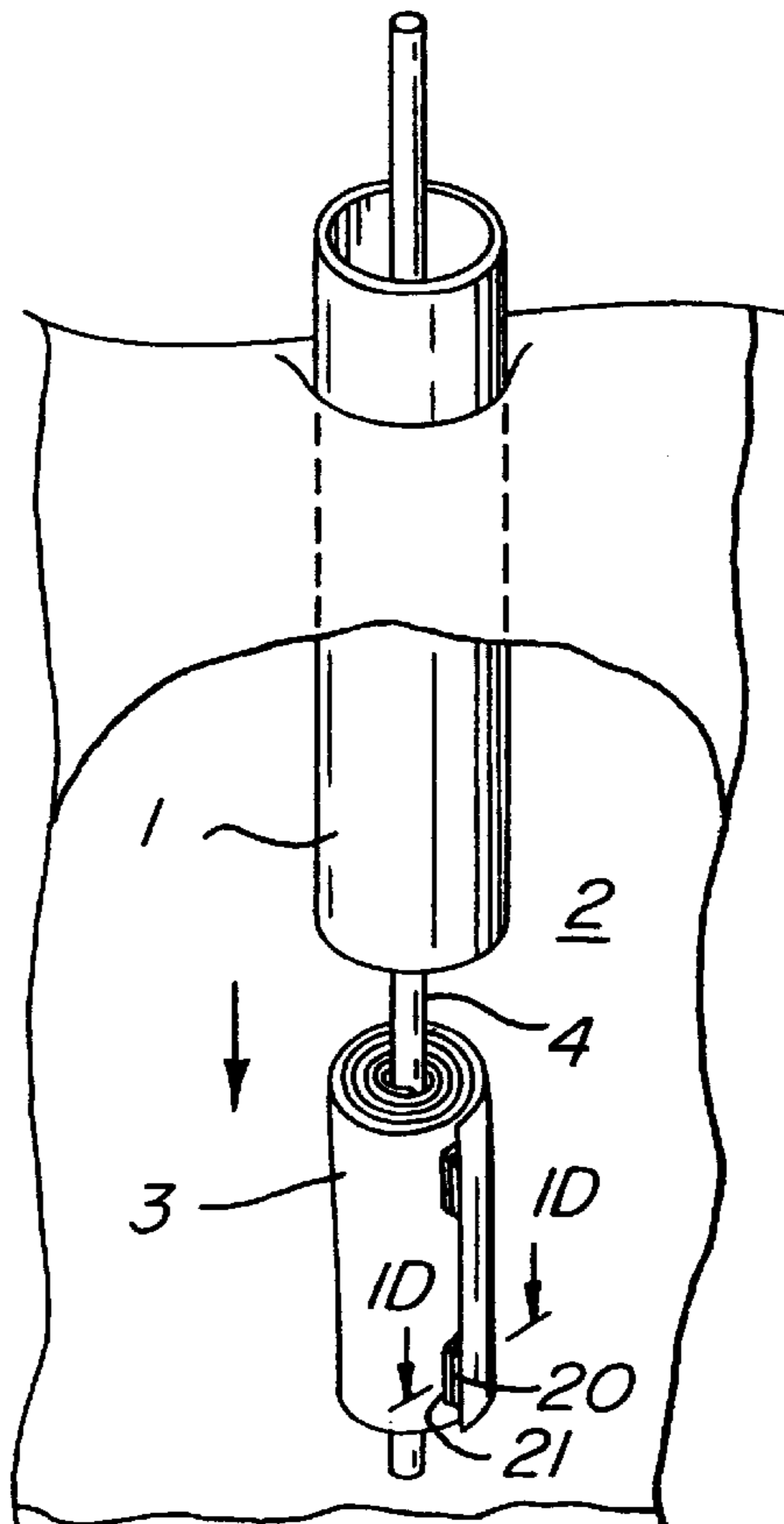
**U.S. PATENT DOCUMENTS**

- 1,275,520 8/1918 Bell .
- 3,372,696 3/1968 Rudie .
- 3,863,639 2/1975 Kleaveland .
- 4,205,680 6/1980 Marshall .
- 4,964,417 10/1990 Peters .
- 5,074,867 12/1991 Wilk .
- 5,122,155 6/1992 Eberbach .
- 5,147,374 9/1992 Fernandez .
- 5,165,425 11/1992 Vermot .
- 5,197,493 3/1993 Grier-Idris .
- 5,209,243 5/1993 Glassman .

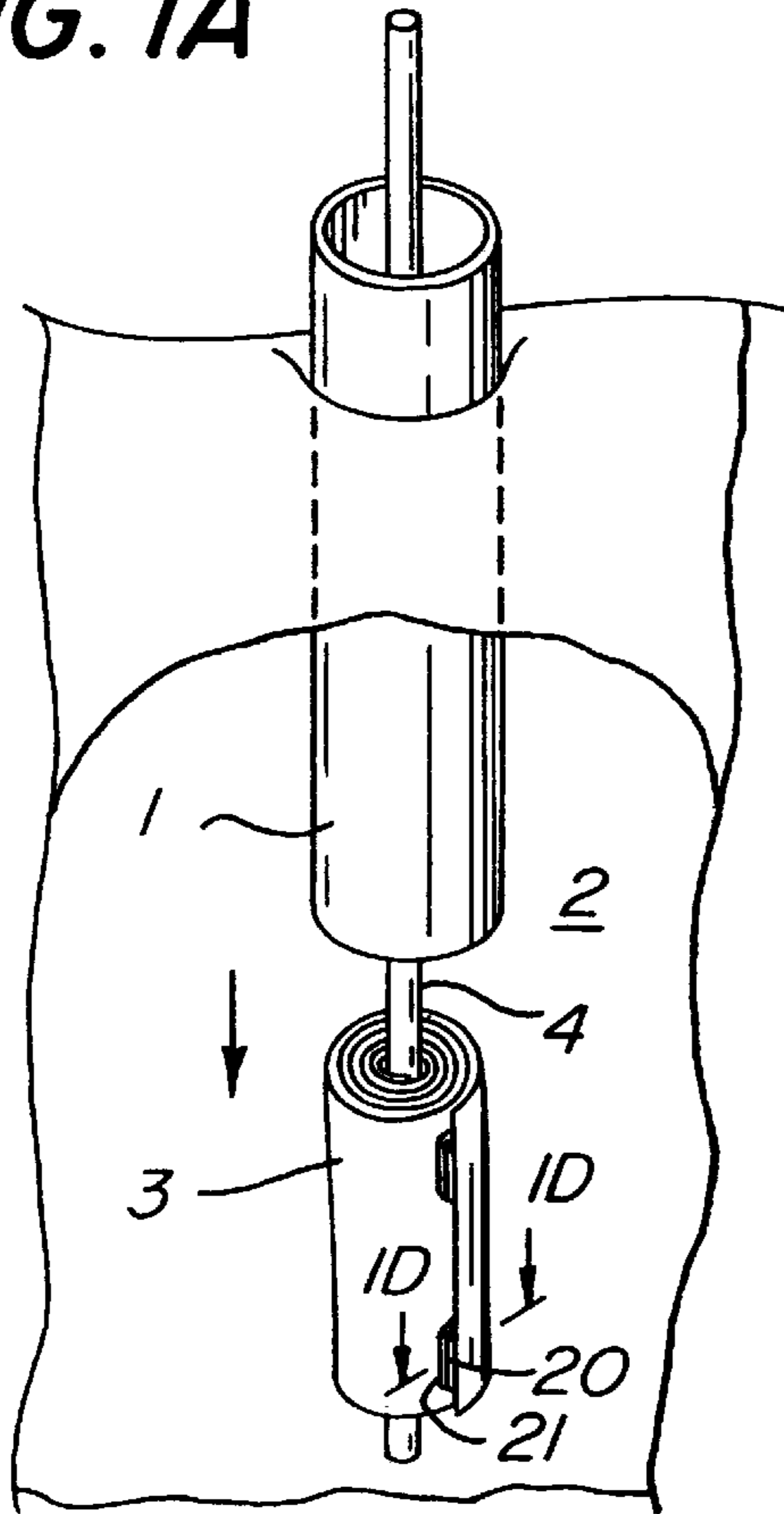
[57] **ABSTRACT**

A reversibly expandable compression pad for compressing tissues and/or organs to provide a relatively unobstructed surgical field during laparoscopic surgery and/or thorascopic surgery. The compression pad is flexible enough to be deployed, manipulated and removed through a laparoscopic access tube, and is heavy enough to compress tissues and/or organs. The pad can also be used as a table on which to rest objects during surgery.

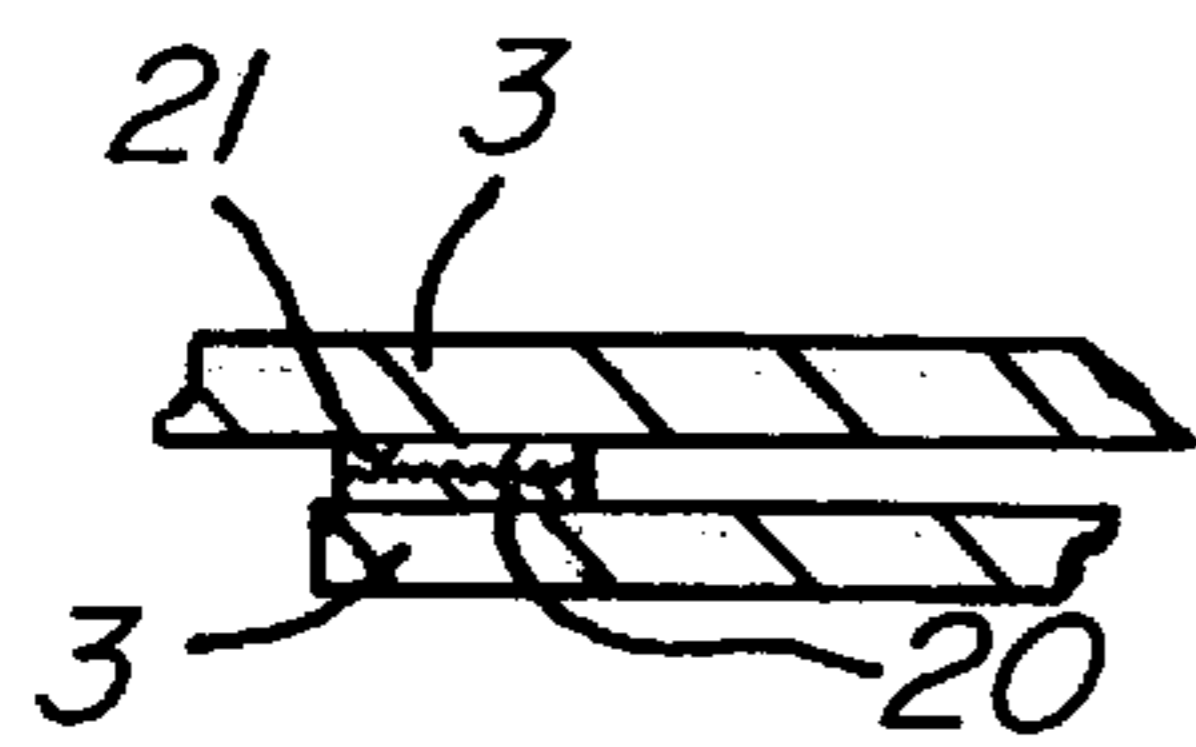
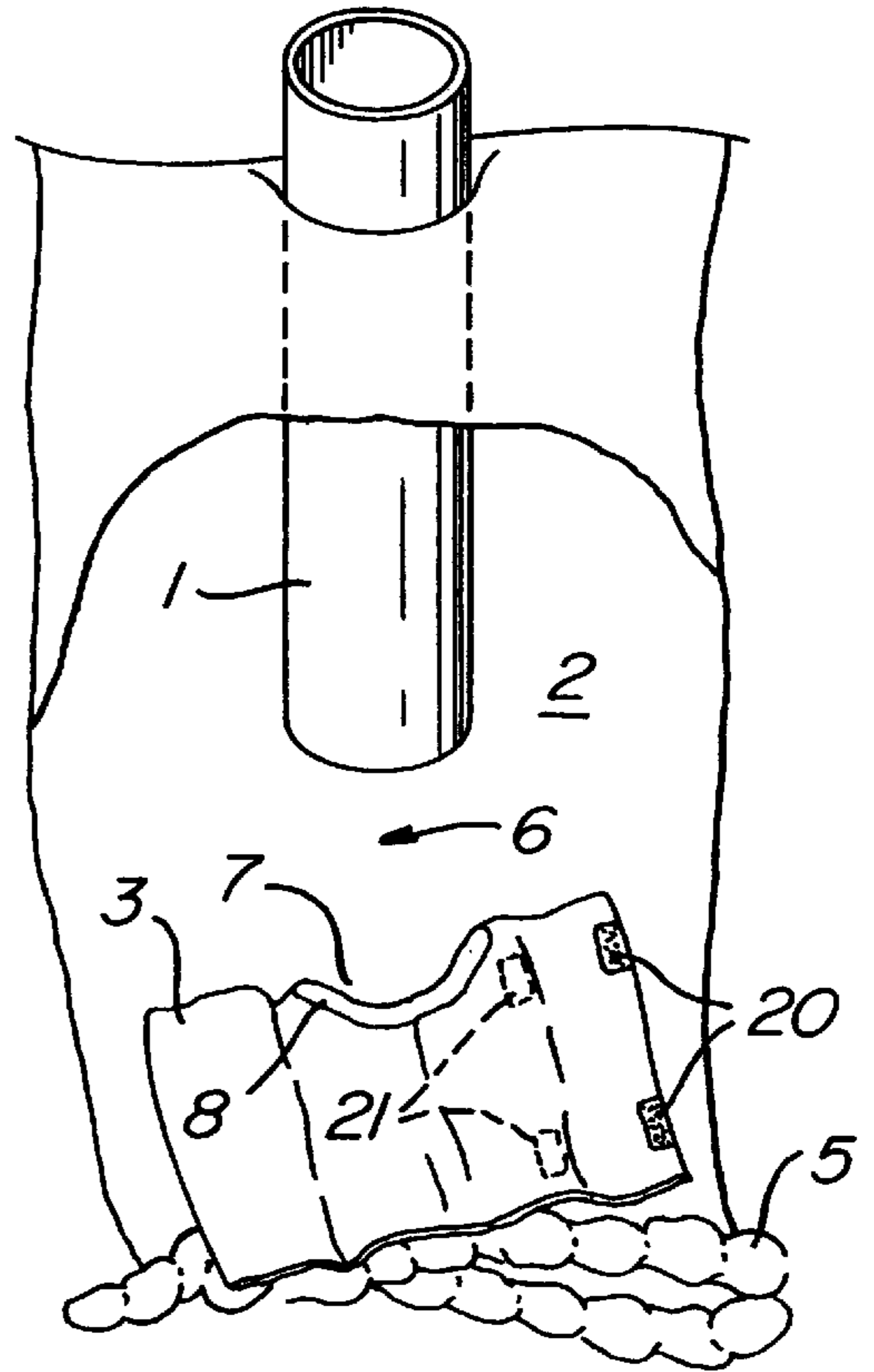
**31 Claims, 3 Drawing Sheets**



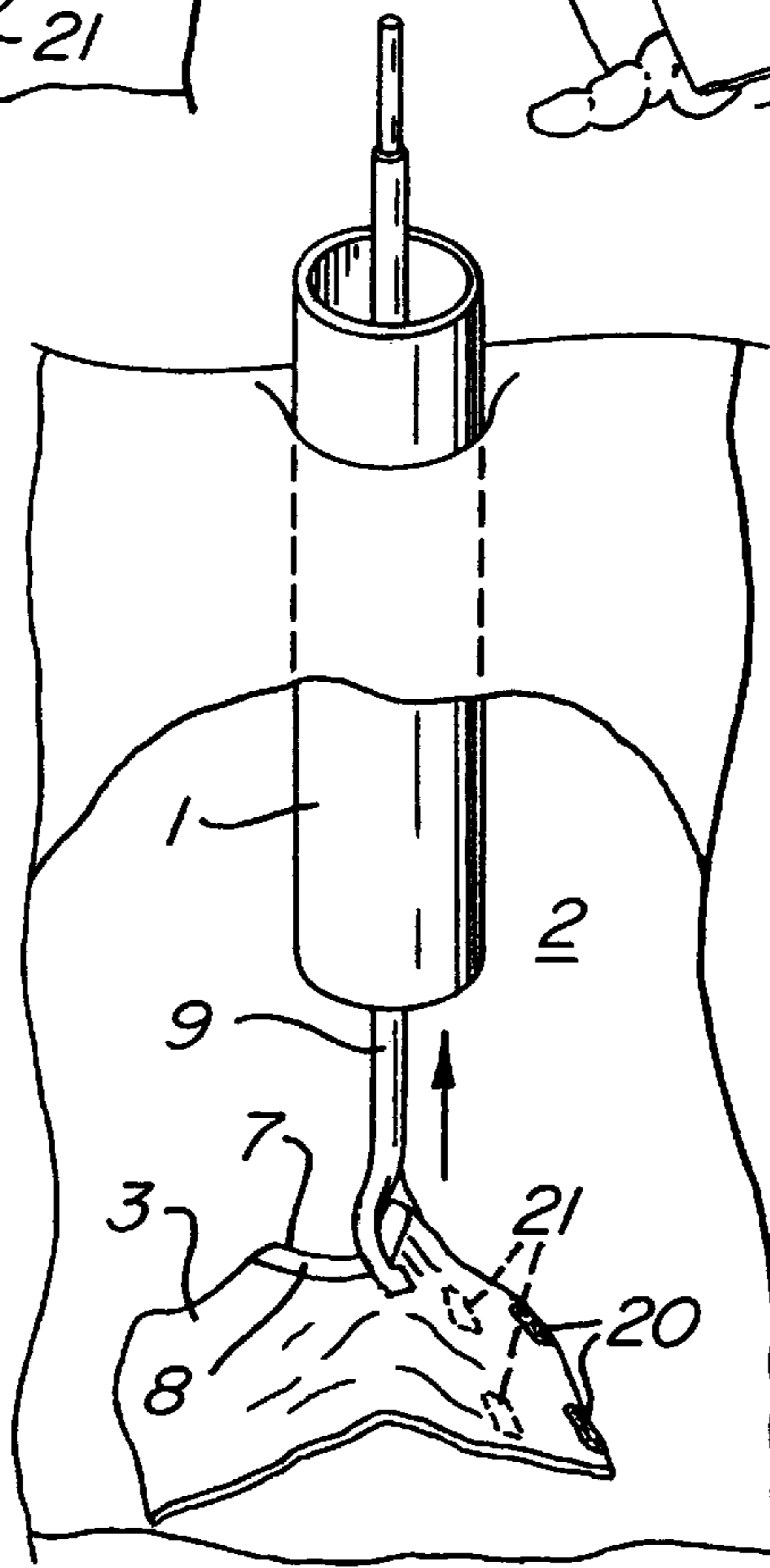
**FIG. 1A**



**FIG. 1B**

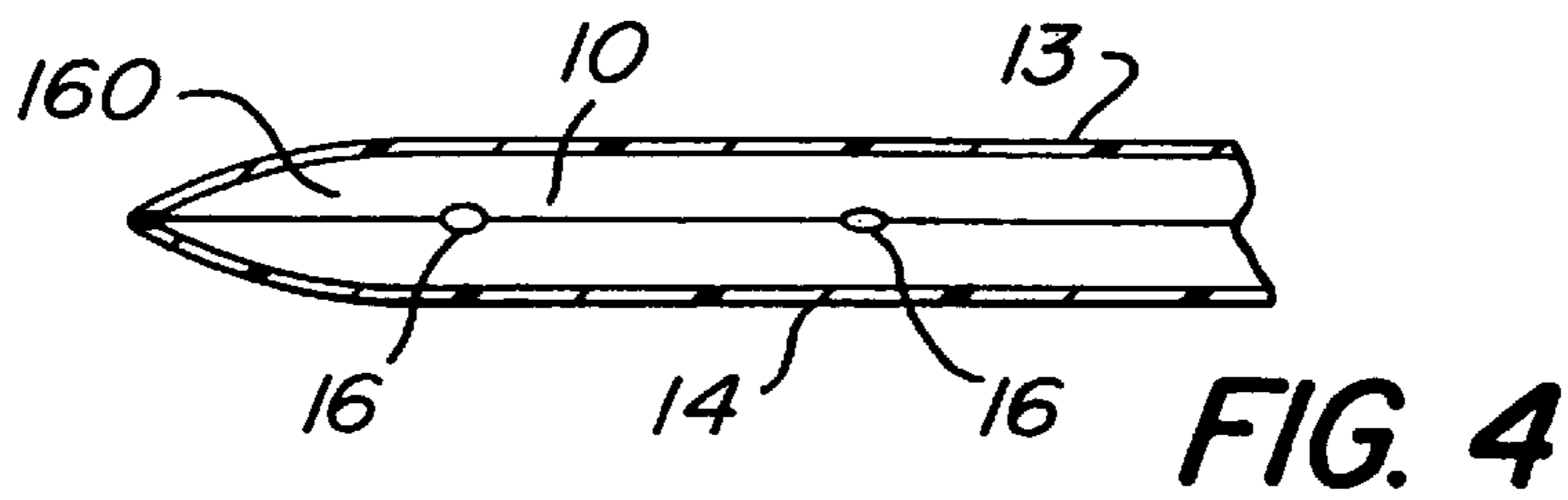
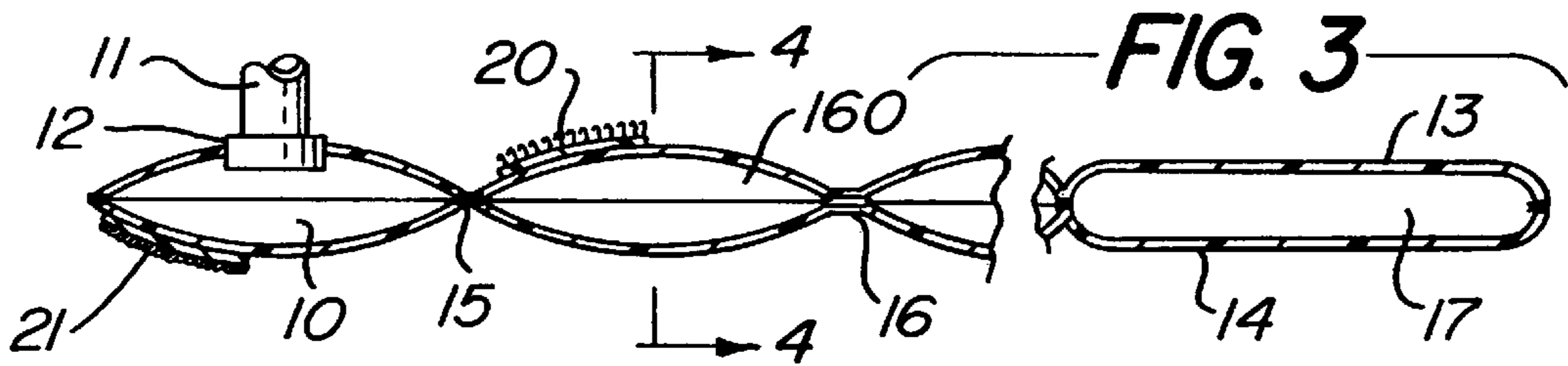
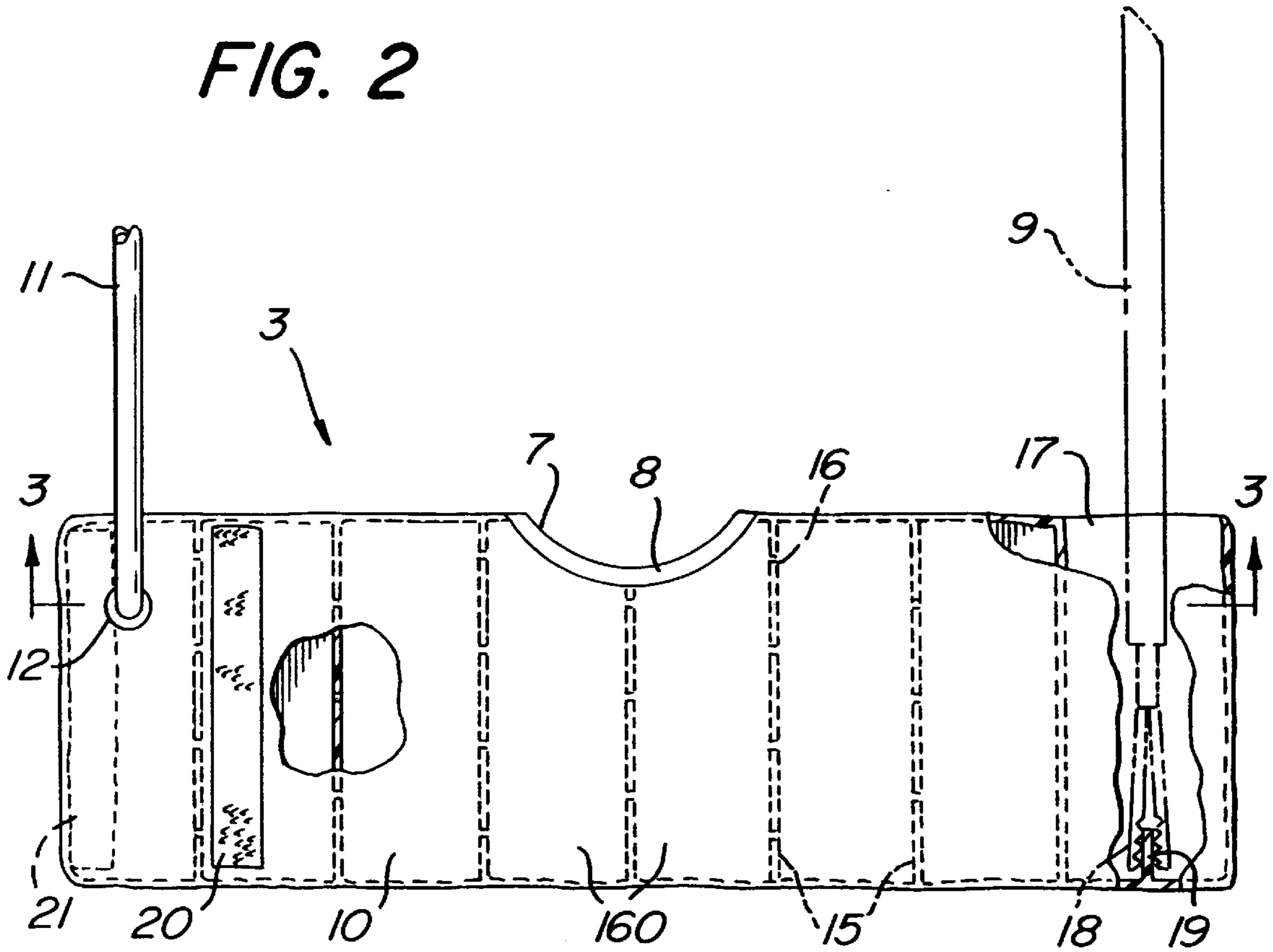


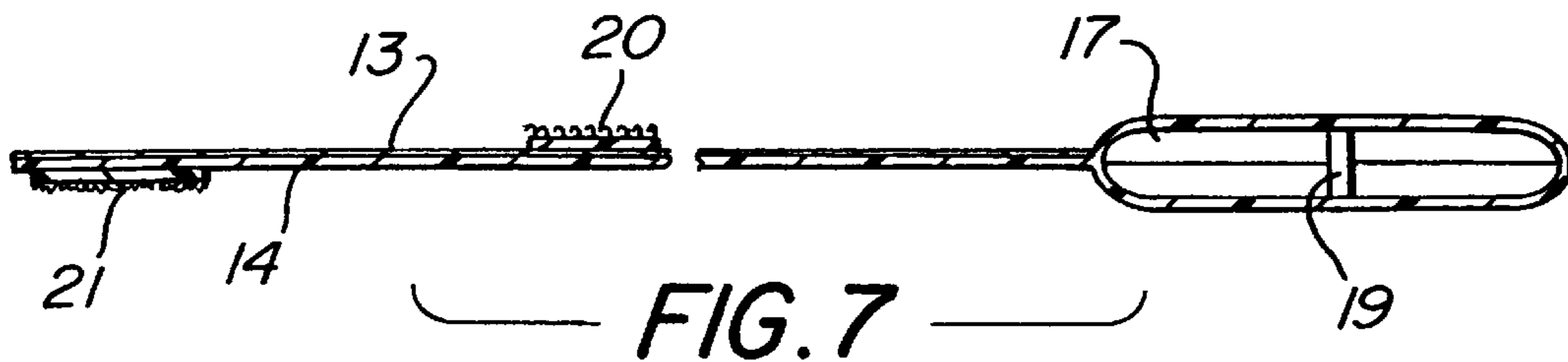
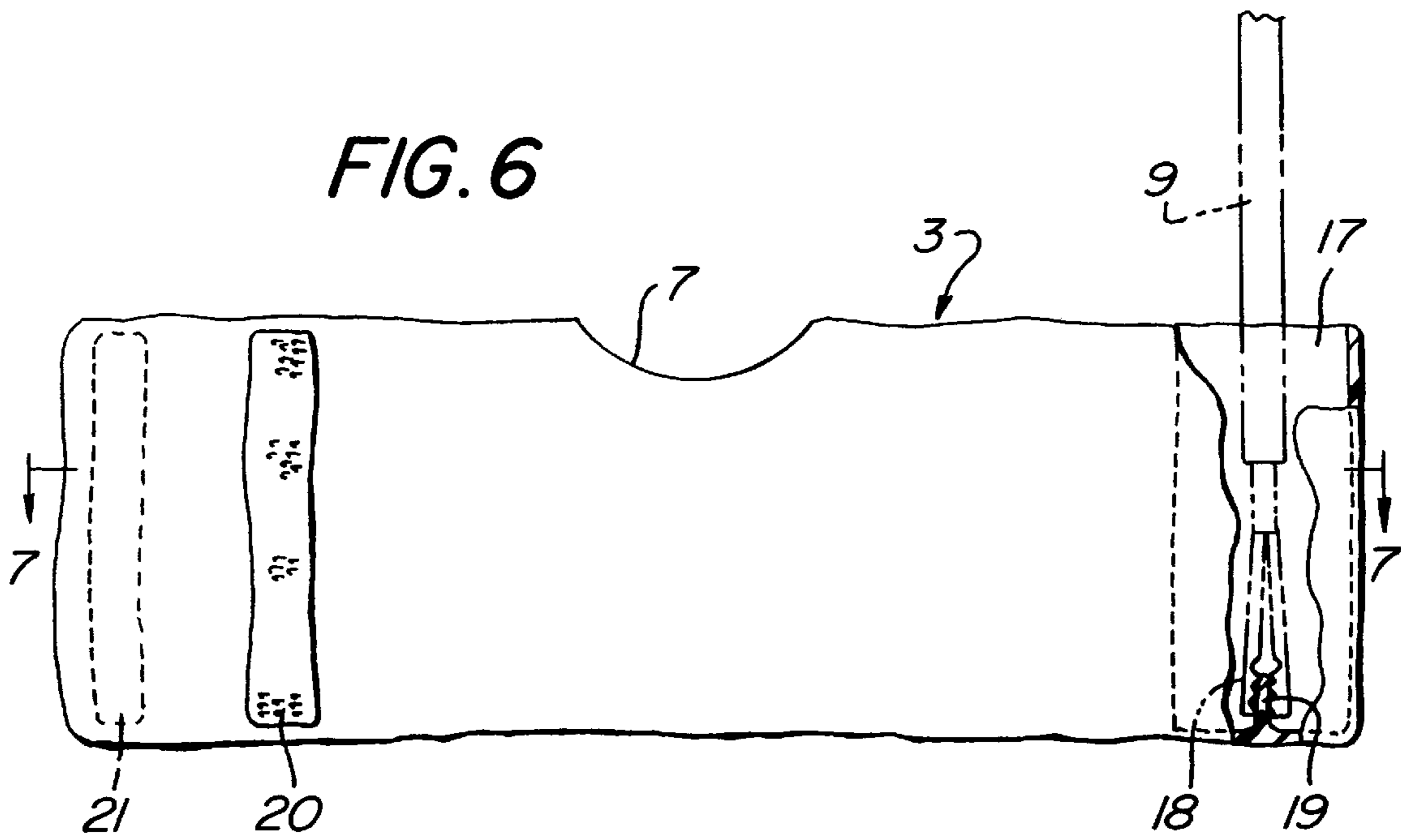
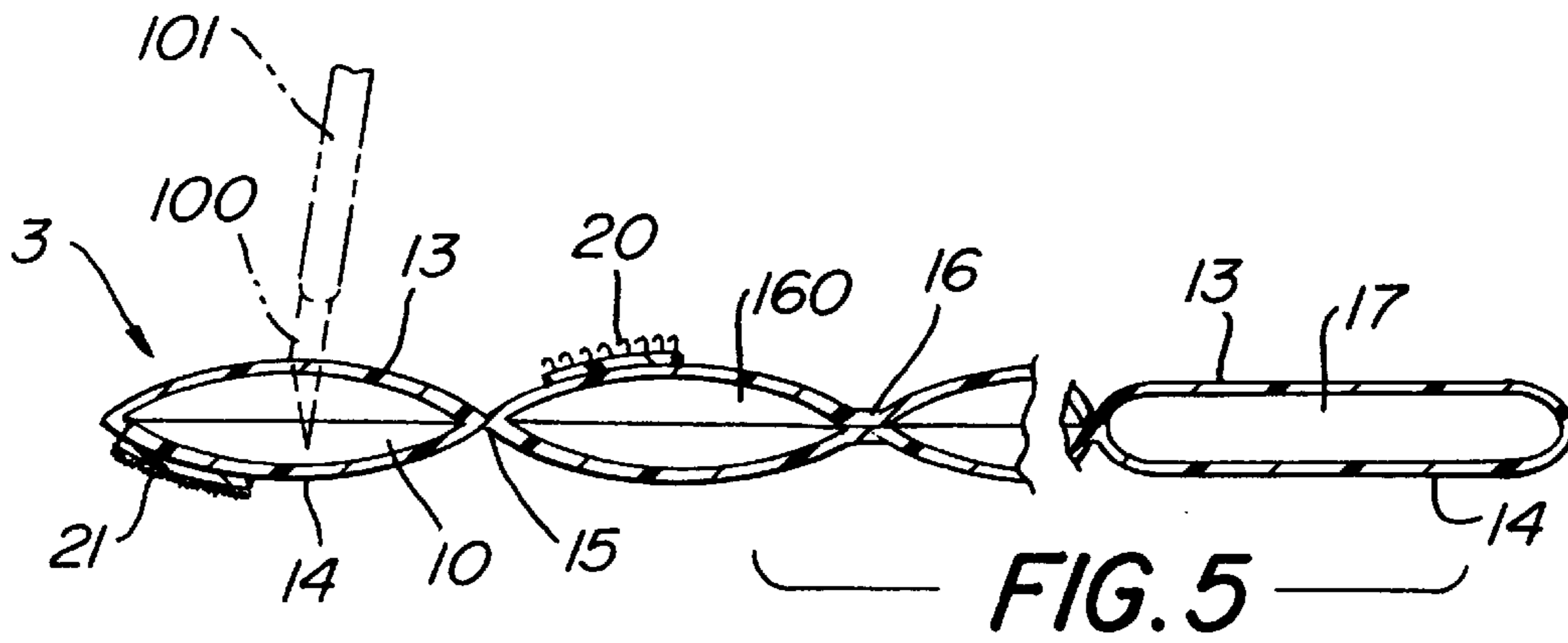
**FIG. 1D**



**FIG. 1C**

FIG. 2





## COMPRESSION PAD FOR LAPAROSCOPIC/ THORASCOPIC SURGERY

### BACKGROUND OF THE INVENTION

Surgeons are required to precisely distinguish between various tissues when performing surgery. A significant amount of time and effort in thoracic and abdominal cavity surgery is devoted to providing unobstructed access to the particular tissue that is being modified, removed and/or replaced. Surgical procedures benefit from an unobstructed surgical field, which provides the surgeon with good visibility of, and a clear path to, the tissues and/or organs of interest. Various means have been employed to create unobstructed surgical fields.

The “non-cutting” hand of the surgeon or a hand of a surgical assistant can, of course, be used to obtain a relatively unobstructed surgical field. However, this means for clearing the surgical field requires a free hand, which may not always be available or accessible to the surgical field. Moreover, the presence of an additional hand in the surgical field can be an impediment in itself.

Metal retractors and spatulas can be used in lieu of an additional hand in the surgical field, but still generally require a surgical assistant to hold the device. Moreover, retractors and spatulas are relatively inflexible, and thus must be removed from the surgical field relatively early in wound closure.

Surgical “fish” or “flounder” are said to provide some of the benefits of an additional hand without the drawbacks. For example, U.S. Pat. No. 4,964,417 to Peters discloses a fish-shaped wound closure device made of a flexible sheet material, adapted to be removably inserted under tissue adjacent to a surgical incision to cover and retain within the body cavity internal organs exposed by the incision.

Similarly, U.S. Pat. No. 3,863,639 to Kleaveland discloses a reversibly inflatable retainer device for temporarily retaining viscera inside the abdominal cavity of a patient during closure of an abdominal incision following surgery.

While the foregoing techniques and devices have been more or less effectively employed during conventional open surgical procedures in which large incisions are created, they are not adapted for use in laparoscopic/thoroscopic surgery, wherein surgical procedures are conducted through at least one surgically created porthole into the patient’s body.

The benefits from laparoscopic/thoroscopic surgery are numerous. Large scars are eliminated, and the process in many instances is relatively bloodless and is much less traumatic to the patient than open surgery. The patient is ambulatory much sooner after laparoscopic/thoroscopic surgery than after open surgery.

However, the limited means for accessing the surgical field during laparoscopic/thoroscopic surgery require that instruments be adapted for deployment via tubes into the patient’s body. Instruments must be narrow enough to be inserted into a patient without causing undue trauma. Moreover, the limited number of portholes cut into the body further limits access to the surgical field to as few as one or two instruments simultaneously.

As with open surgery, laparoscopic/thoroscopic surgery requires a relatively unobstructed surgical field. In particular, the relatively free-floating intestines frequently obstruct the surgical field during abdominal cavity laparoscopies. Thus, there has been a need for a device that helps to provide an unobstructed surgical field for laparoscopic/thoroscopic surgery.

All references cited herein are incorporated herein by reference in their entireties.

### SUMMARY OF THE INVENTION

The instant invention addresses at least the foregoing deficiencies of the prior art by providing a compression pad for laparoscopic/thoroscopic surgery which can be inserted through a laparoscopic/thoroscopic surgery porthole or tube, expanded within the body cavity to compress tissues and/or organs and maintain a relatively unobstructed surgical field, and compressed, deflated or folded to a configuration that can be removed through the same passageway through which it entered.

The invention also provides a method for eliminating tissue obstructions from a surgical field within a body cavity of a patient during laparoscopic/thoroscopic surgery, the method comprising inserting a surgical compression pad for laparoscopic/thoroscopic surgery into the body cavity through an access tube into the body cavity, wherein the pad is flexible and expandable; expanding the pad to a shape that is too large to pass unchanged through the tube; and contacting tissue adjacent to the surgical field with the expanded pad to define a relatively unobstructed surgical field from which tissues and/or organs that are not involved in the surgical procedure are separated.

### BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be described in conjunction with the following drawings in which like reference numerals designate like elements and wherein:

FIGS. 1A, 1B and 1C are somewhat idealized, sequential, fragmentary perspective views of an embodiment of the invention being deployed, as deployed and being removed, with a portion of the body partially cut away;

FIG. 1D is a cross-sectional view through line 1D—1D of FIG. 1A;

FIG. 2 is a plan view of a particularly preferred embodiment of the invention, with portions of the top layer cut away to reveal underlying details;

FIG. 3 is a cross-sectional view through line 3—3 of FIG. 2;

FIG. 4 is a cross-sectional view through line 4—4 of FIG. 3;

FIG. 5 is a cross-sectional view of an alternative embodiment of FIG. 3;

FIG. 6 is a plan view of yet another embodiment of the invention, with a portion of the top layer cut away to reveal underlying details; and

FIG. 7 is a cross-sectional view through line 7—7 of FIG. 6.

### DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

This disclosure focuses on laparoscopy procedures and tools as the preferred embodiment of the invention; however, the invention encompasses the use of the compression pads of the invention in any laparoscopic surgery and/or thoroscopic surgery within a body cavity through tubes or trocars.

FIGS. 1A, 1B and 1C show a tube or trocar 1 inserted into a patient’s body cavity 2 to act as an access port for a laparoscopic procedure into the body cavity 2. Preferably prior to operating on the tissues and/or organs of interest, a laparoscopic/thoroscopic compression pad 3 is wound

around a deployment tool **4** so as to fit through tube **1**. After entering body cavity **2**, pad **3** is unwound from tool **4** by rotating tool **4**. The inertial mass of pad **3** can be sufficient to ensure that pad **3** unwinds from tool **4**; however, unwinding can be facilitated by grasping pad **3** with a grasping tool (not shown in FIG. 1A), such as a forceps, which may be inserted through the same or a different tube/trocar.

As shown in FIG. 1B, the pad **3** unwinds to adopt a configuration providing a much larger surface area than in its wound configuration. Unwound pad **3** is sufficiently heavy to compress tissues and/or organs beneath it, such as the intestines **5**, thus providing a relatively unobstructed surgical field **6**.

Preferably, pad **3** is notched with an organ isolating notch **7** for better positioning within body cavity **2**. The edge of notch **7** is preferably weighted with a strip of material **8**, such as bismuth or lead, to cause the edge to be biased downwardly and assist in providing a relatively unobstructed surgical field.

In addition to its tissue and/or organ compressing function, pad **3** acts as a suction aid by preventing tissues and/or organs from blocking suction devices (not shown) used in laparoscopic/thoroscopic surgery.

Pad **3** can also act as an internal table on which objects can be temporarily rested during surgery. Pad **3** can be provided with pockets, or the like, for temporarily restraining objects rested thereon. Such pockets or restraints could be used to store surgical instruments, which could be inserted into and/or removed from body cavity **2** separately from pad **3** and/or with pad **3**.

Pad **3** is removed from body cavity **2** after completion of the essential object of the surgical procedure, and prior to closing. FIG. 1C shows one way of removing pad **3**, wherein a grasping tool **9**, such as, e.g., forceps, is used to grasp pad **3**, and remove it from body cavity **2** through tube **1**. In such a case, pad **3** must be sufficiently thin and flexible to be removed from body cavity **2** without injuring the patient. Suitable materials for such a pad **3** include rubber and biologically inert flexible synthetic resin materials, such as polyethylene or nylon, which are impermeable to microorganisms.

Alternatively, pad **3** can be removed from body cavity **2** by rewinding it about deployment tool **4** or another tool inserted through tube **1** and pulling the tool and pad **3** out of body cavity **2**. Pad **3** can be rewound about the tool using solely the tool, or the tool in combination with a grasping tool (not shown). If only the tool is used to rewind pad **3**, it is preferred that the tool and/or pad **3** include means for preventing pad **3** from sliding on the surface of the tool as the tool is rotated. Such means include frictional means, mechanical means, magnetic means and adhesive means.

The tool and pad **3** can frictionally engage each other by providing at least one of them with a roughened surface. Preferably, the tool and pad **3** have opposing complementary portions of VELCRO® **20** and **21** attached thereto, as shown in detail in FIG. 1D, to facilitate insertion and removal of pad **3**.

The tool and pad **3** can mechanically engage each other by, e.g., providing the tool with a slot for receiving an edge of pad **3**, wherein the slot holds the edge while the tool is rotated. Alternatively, a grasping tool can be used to grasp a portion of pad **3**, while the pad is wound about the tool by rotating the tool.

The tool and pad **3** can magnetically engage each other by providing a magnet on at least one of them. If the tool is metal, the magnet can be provided on pad **3**. If pad **3** is

metal, the magnet can be provided on the tool. If neither the tool nor pad **3** are metal, magnets of opposing polarity can be provided on the tool and pad.

The tool and pad **3** can adhesively engage each other by providing a physiologically compatible adhesive on at least one of them.

The construction of tube **1** is not particularly limited, and can be any tube suitable for accessing internal body cavities during laparoscopic/thoroscopic surgery.

In the embodiment of the invention wherein pad **3** is removed by winding it around a tool, pad **3** can comprise, e.g., a physiologically acceptable film and/or woven material. In certain embodiments, ballast can be incorporated into pad **3** and/or attached to pad **3**, to facilitate moving tissues and/or organs out of the surgical field. For example, metal shafts, particularly steel shafts, can be attached to pad **3** such that the shafts are parallel to deployment tool **4** when pad **3** is wound around tool **4**. These shafts also affect the unwound structure of pad **3**.

The construction of deployment tool **4** is not particularly limited, provided that the tool is sufficiently rigid and long to accomplish its purpose of deploying pad **3** into body cavity **2** through tube **1**.

FIGS. 2-4 depict a particularly preferred embodiment of the invention, wherein pad **3** is an expandable member, as will be described in detail hereinafter. After being introduced into body cavity **2** through tube **1**, pad **3** is unwound and expanded by being injected with a fluid **10**. In addition to expanding pad **3**, fluid **10**, which preferably is a saline solution, weighs down pad **3** sufficiently to compress tissues and/or organs underlying pad **3**, thereby providing a relatively unobstructed surgical field above pad **3**.

As shown in FIGS. 2 and 3, pad **3** can be injected with fluid **10** through filling tube **11** connected between a one-way valve **12** on pad **3** and a fluid reservoir (not shown). After filling pad **3** with a desired volume of fluid **10**, filling tube **11** can be separated from valve **12** and completely withdrawn from tube **1** or other tube/trocar through which filling tube **11** enters body cavity **2**, to thereby free-up the tube/trocar as an access port for other laparoscopic instruments. Filling can also be accomplished by connecting the one-way valve **12** to a conventional aspirating device through a catheter.

As shown in FIGS. 2-4, pad **3** is a generally rectangular structure having rounded corners and an organ-isolating notch **7** in one edge thereof. Pad **3** preferably is formed of a pair of substrates **13** and **14** comprising any suitable flexible material(s), such as rubber, and the substrates are bonded together at transversely spaced apart, elongate regions **15**. Each elongate region **15** preferably is interrupted by channels **16** in one or more locations to provide communication among the various compartments **160** formed between these elongate regions **15**.

It should be understood that the peripheral edges of substrates **13** and **14** also are bonded together except at one portion thereof, at which there is provided a grasping tool passage **17**. It should also be understood that the figures are not drawn to scale, and that the width of passage **17** is preferably much narrower than the widths of compartments **160**. Grasping tool passage **17** preferably has a transverse dimension of approximately 6 mm, and provides a passage, or tunnel, for receiving a conventional 5 mm grasping tool **9** therein.

In order to facilitate rolling and unrolling pad **3** for passage through the tube or trocar, a grasping end **18** of grasping tool **9** is inserted into passage **17** and clamped to a

projecting tab **19** connected to one of substrates **13** and **14** at the closed end of passage **17**. Grasping tool **9** is then rotated to roll up pad **3**. In order to maintain pad **3** in its rolled-up condition, complementary VELCRO® strips **20** and **21** are provided on external surfaces of substrates **13** and **14** which oppose each other when pad **3** is rolled-up in the same manner as described earlier in connection with the embodiment shown in FIGS. 1A–1D.

In an alternative embodiment shown in FIG. 5, the pad **3** can be filled with fluid **10** using a needle **100**, which temporarily pierces a self-sealing surface of a substrate **13** of pad **3**. Needle **100** is attached to a catheter or filling tube **101**, which passes through the tube or trocar. After filling pad **3** with a desired volume of fluid **10**, needle **100** and catheter **101** are preferably completely withdrawn from the tube or trocar, freeing-up the tube or trocar as an access port for other laparoscopic instruments. However, if desired, catheter **101** can be left in place and a conventional catheter closure can be employed to retain the liquid in the compression pad, or the needle and catheter assembly can be removed from the compression pad, since the surface material will self-seal.

In those embodiments wherein pad **3** is filled with fluid **10**, pad **3** is removed from body cavity **2** at the end of the procedure, prior to closing, by substantially emptying fluid **10** from pad **3** before removing pad **3** from body cavity **2**, grasping the substantially emptied pad **3** with a grasping tool **9** inserted through tube **1** (or another entry port), winding pad **3** about grasping tool **9**, and pulling pad **3** and grasping tool **9** out of body cavity **2**. When fluid **10** is physiologically compatible, e.g., normal saline solution, it can be emptied directly into body cavity **2** by opening a hole in pad **3**. Such a hole can be created using any suitable means, such as a scalpel, scissors or any other cutting or piercing tool.

When fluid **10** is physiologically incompatible, it is suctioned out of pad **3** without contacting the patient with it. A suitable suction device can be connected to a piercing needle for removing fluid **10** from within the compression pad.

In the embodiments of the invention wherein pad **3** is expanded by fluid injection, at least one of substrates **13** and **14** can comprise a thin and flexible plastic layer, which can be, e.g., the same material used as a gall bladder holding bag in the Auto Suture Endo Catch®, as described in U.S. Pat. No. 5,074,867. Thus, suitable materials for pad **3** include rubber, and biologically inert flexible synthetic resin materials, such as polyethylene or nylon, which are impermeable to micro-organisms.

The shape of pad **3** in all embodiments is preferably rectangular, with rounded corners. It is particularly preferred to include an organ-isolating notch **7** in one edge thereof, as shown in the figures, to facilitate placement of pad **3** within body cavity **2**. In the preferred embodiment shown in FIG. 2, pad **3** includes a strip **8** of a heavy compound, such as lead or bismuth, provided along the length of notch **7** to add weight to the system.

In the most preferred embodiment, the external surface of the top substrate **13** of pad **3** is reflective, to aid in illuminating the site of the surgical procedure, and the bottom substrate **14** of pad **3** is roughened, such as is generally provided by a rubber substrate, to prevent pad **3** from inadvertently sliding within the body.

Fluid **10** preferably has a specific gravity substantially greater than 1 to ensure that pad **3** is heavy enough to pin down tissues and/or organs. The specific gravity of the fluid can be about 1 to about 14, preferably, at least about 2, more preferably, at least about 3. The fluid can comprise mercury,

or any other heavy metal; however, it is preferred that such additives be nontoxic. Normal saline solution is the most preferred fluid.

Fluid **10** and filling tube **11** can combine to act as a fiber optic device, through which light is transmitted into body cavity **2** from outside the patient. Of course, in such an embodiment, it is advantageous to maintain the connection between filling tube **11** and valve **12** after filling pad **3** with fluid **10**. As previously discussed, another way that lighting within body cavity **2** can be enhanced by the invention is by including reflective surfaces on pad **3** for enhancing the lighting within body cavity **2**.

FIGS. 6 and 7 depict another embodiment of the invention, wherein pad **3** comprises a planar laminate of substrates **13** and **14**, which can be fabric substrates. At least one of substrates **13** and **14** comprises a heavy material, such as lead or bismuth, which can be provided in a variety of forms, including, e.g., as fibers woven into the substrate or as a film. Substrates **13** and **14** should comprise materials sufficiently flexible to be rolled up for deployment and removal. Pad **3** is rolled up by grasping tab **19** in passage **17** with the grasping end **18** of grasping tool **9**, and then rotating grasping tool **9** until VELCRO® tabs **20** and **21** engage one another. Pad **3** will then readily pass through a tube or trocar.

Unlike the embodiment depicted in FIG. 2, pad **3** of FIGS. 6 and 7 is not adapted to be filled with a fluid, since it is preweighted with a solid heavy material, such as bismuth or lead.

While the invention has been described in detail and with reference to specific examples thereof, it will be apparent to one skilled in the art that various changes and modifications can be made therein without departing from the spirit and scope thereof.

What is claimed is:

1. A method for eliminating tissue obstructions from a surgical field within a body cavity of a patient during laparoscopic/thoroscopic surgery, said method comprising:

inserting a surgical compression pad for laparoscopic/thoroscopic surgery into said body cavity through an access tube into said body cavity, wherein said pad is flexible and expandable;

expanding said pad to a shape for compressively contacting tissue adjacent to and underlying said surgical field, said shape being too large to pass unchanged through said tube;

compressively contacting tissue adjacent to and underlying said surgical field with said expanded compression pad to protectively separate and eliminate said adjacent tissue from said surgical field; and

performing a surgical procedure in said surgical field while maintaining said expanded compression pad compressively contacting tissue adjacent to an underlying said surgical field.

2. A method for eliminating tissue obstructions from a surgical field within a body cavity of a patient during laparoscopic/thoroscopic surgery, said method comprising:

providing a compression pad in the form of a sheet;

winding said compression pad around a deployment tool;

inserting said wound compression pad into said body cavity through an access tube into said body cavity, said pad being flexible and expandable;

unwinding said pad and thereby releasing said pad from said deployment tool after passing through said tube;

expanding said pad to a shape that is too large to pass unchanged through said tube; and

contacting tissue adjacent to said surgical field with said expanded pad to separate and eliminate said adjacent tissue from said surgical field, said pad having a weight sufficient to displace said adjacent tissue from said surgical field; and removing said pad from said body cavity by grasping said pad with a grasping tool inserted through said tube, rewinding said pad about said grasping tool and pulling said grasping tool and pad out of said body cavity.

**3.** A method for eliminating tissue obstructions from a surgical field within a body cavity of a patient during laparoscopic/thoroscopic surgery, said method comprising:

inserting a surgical compression pad for laparoscopic/thoroscopic surgery into said body cavity through an access tube into said body cavity, said pad being a flexible and expandable fluid receiving packet;

expanding said pad to a shape that is too large to pass unchanged through said tube by injecting a fluid into said pad; and

contacting tissue adjacent to said surgical field with said expanded pad to separate and eliminate said adjacent tissue from said surgical field.

**4.** The method of claim **3**, wherein said pad comprises a self-sealing material through which said fluid is injected.

**5.** The method of claim **4**, wherein said pad is inserted through said tube by pushing said pad through said tube with a deployment tool in contact with said pad, and said pad is freed from contact with said deployment tool after passing said pad through said tube.

**6.** The method of claim **3**, further comprising removing said pad from said body cavity by substantially emptying said fluid from said pad before removing said pad from said body cavity, grasping said substantially emptied pad with a grasping tool inserted through said tube and pulling said pad and said grasping tool out of said body cavity.

**7.** The method of claim **6**, wherein said emptied pad is wound around said grasping tool before being pulled out of said body cavity.

**8.** The method of claim **6**, wherein said fluid is emptied into said body cavity by opening a hole in said pad and said fluid is physiologically compatible.

**9.** The method of claim **6**, wherein said fluid is suctioned out of said pad without contacting said patient with said fluid.

**10.** The method of claim **9**, wherein said fluid is physiologically incompatible.

**11.** The method of claim **6**, wherein said fluid has a specific gravity of about 1 to about 14.

**12.** The method of claim **9**, wherein said fluid has a specific gravity of at least about 2.

**13.** The method of claim **9**, wherein said fluid has a specific of at least about 3.

**14.** The method of claim **6**, wherein said fluid comprises mercury.

**15.** The method of claim **3**, wherein said pad is attached to a fluid conduit through which said fluid is injected into said pad, and through which light is transmitted into said body cavity.

**16.** The method of claim **3**, wherein said pad comprises a one-way valve into which said fluid is injected.

**17.** The method of claim **3**, wherein said pad comprises a reflective face and a slip-resistant face.

**18.** The method of claim **3**, wherein said pad comprises an organ isolating notch which is nestled against an organ during surgery.

**19.** The method of claim **18**, wherein said pad further comprises a bismuth or lead strip along an edge of said notch.

**20.** A method for eliminating tissue obstructions from a surgical field within a body cavity of a patient during laparoscopic/thoroscopic surgery, said method comprising:

providing a compression pad in the form of a sheet;

winding said compression pad around a deployment tool;

inserting the deployment tool with the compression pad wound thereon into said body cavity through an access tube into said body cavity, said pad being flexible and expandable, said pad comprising a reflective face and a slip-resistant face;

expanding said pad to a shape that is too large to pass unchanged through said tube; and

contacting tissue adjacent to said surgical field with the slip-resistant face of said expanded pad to separate and eliminate said adjacent tissue from said surgical field, said pad having a weight sufficient to displace said adjacent tissue from said surgical field.

**21.** A method for eliminating tissue obstructions from a surgical field within a body cavity of a patient during laparoscopic/thoroscopic surgery, said method comprising:

providing a compression pad in the form of a sheet;

winding said pad around a deployment tool;

inserting said tool with the pad wound therearound into said body cavity through an access tube into said body cavity, wherein said pad is flexible and expandable and comprises an organ isolating notch which is nestled against an organ during surgery;

expanding said pad to a shape that is too large to pass unchanged through said tube; and

contacting tissue adjacent to said surgical field with said expanded pad to separate and eliminate said adjacent tube from said surgical field, said pad having a weight sufficient to displace said adjacent tissue from said surgical field.

**22.** The method of claim **21**, wherein said pad further comprises a bismuth or lead strip along an edge of said notch.

**23.** A compression pad for laparoscopic and thoroscopic surgery for eliminating tissue obstructions from a surgical field within a body cavity of a patient, said pad being capable of reversibly assuming at least two configuration; one of said at least two configurations being a contracted configuration in which said pad fits within and passes through an access tube inserted into a body cavity, and the other of said at least two configurations being an expanded configuration in which said pad cannot fit within or pass through said tube, said pad including a substantially rectangular sheet with an organ isolating notch along an edge thereof and a strip of at least one metal selected from the group consisting of lead and bismuth along an edge of said notch, wherein, at least in said expanded configuration, said pad is sufficiently heavy to compress tissue underlying said pad for isolating said tissue from a surgical field during surgery.

**24.** A compression pad for laparoscopic and thoroscopic surgery for eliminating tissue obstructions from a surgical field within a body cavity of a patient, said pad being capable of reversibly assuming at least two configurations; one of said at least two configurations being a contracted configuration in which said pad fits within and passes through an access tube inserted into a body cavity, and the other of said at least two configurations being an expanded configuration in which said pad cannot fit within or pass through said tube, wherein said pad comprises at least one metal selected from the group consisting of lead and bismuth, wherein, at least in said expanded configuration, said pad is sufficiently heavy



to compress tissue underlying said pad for isolating said tissue from a surgical field during surgery.

**25.** A compression pad for laparoscopic and thorascopic surgery for eliminating tissue obstructions from a surgical field within a body cavity of a patient, said pad being capable of reversibly assuming at least two configurations; one of said at least two configurations being a contracted configuration in which said pad fits within and passes through an access tube inserted into a body cavity, and the other of said at least two configurations being an expanded configuration in which said pad cannot fit within or pass through said tube, wherein said pad comprises a reflective face and a slip-resistant face, wherein, at least in said expanded configuration, said pad is sufficiently heavy to compress tissue underlying said pad for isolating said tissue from a surgical field during surgery.

**26.** A compression pad for laparoscopic and thorascopic surgery for eliminating tissue obstructions from a surgical field within a body cavity of a patient, said pad being capable of reversibly assuming at least two configurations; one of said at least two configurations being a contracted configuration in which said pad fits within and passes through an access tube inserted into a body cavity, and the other of said at least two configurations being an expanded configuration in which said pad cannot fit within or pass through said tube, wherein said pad comprises fasteners on surfaces that oppose each other when said pad is in said contracted configuration, said fasteners being adapted to reversibly engage each other to reversibly maintain said pad in said contracted configuration, wherein, at least in said expanded configuration, said pad is sufficiently heavy to compress tissue underlying said pad for isolating said tissue from a surgical field during surgery.

**27.** A compression pad for laparoscopic and thorascopic surgery for eliminating tissue obstructions from a surgical field within a body cavity of a patient, said pad being capable of reversibly assuming at least two configurations; one of said at least two configurations being a contracted configuration in which said pad fits within and passes through an access tube inserted into a body cavity, and the other of said at least two configurations being an expanded configuration in which said pad cannot fit within or pass through said tube, wherein said pad comprises two flexible substrates bonded together at transversely spaced apart, elongate regions interrupted by channels, said two flexible substrates also are bonded together along entire peripheries thereof, except at an end of said pad at which there is a grasping tool passage with a tab for grasping therein, wherein, at least in said expanded configuration, said pad is sufficiently heavy to compress tissue underlying said pad for isolating said tissue from a surgical field during surgery.

**28.** A compression pad for laparoscopic and thorascopic surgery for eliminating tissue obstructions from a surgical field within a body cavity of a patient, said pad being capable of reversibly assuming at least two configurations; one of said at least two configurations being a contracted configuration in which said pad fits within and passes through an access tube inserted into a body cavity, and the other of said

at least two configurations being an expanded configuration in which said pad cannot fit within or pass through said tube, wherein said pad comprises two flexible substrates bonded together at transversely spaced apart, elongate regions interrupted by channels, and at peripheral edges of said substrates, and wherein said bonded substrates define a fluid holding cavity therebetween, said pad being in a form of a substantially rectangular sheet with an organ isolating notch along an edge thereof, wherein, at least in said expanded configuration, said pad is sufficiently heavy to compress tissue underlying said pad for isolating said tissue from a surgical field during surgery.

**29.** The compression pad of claim **28**, wherein a strip of at least one metal selected from the group consisting of lead and bismuth is along an edge of said notch.

**30.** A compression pad for laparoscopic and thorascopic surgery for eliminating tissue obstructions from a surgical field within a body cavity of a patient, said pad being capable of reversibly assuming at least two configurations; one of said at least two configurations being a contracted configuration in which said pad fits within and passes through an access tube inserted into a body cavity, and the other of said at least two configurations being an expanded configuration in which said pad cannot fit within or pass through said tube, wherein said pad comprises two flexible substrates bonded together at transversely spaced apart, elongate regions interrupted by channels, and at peripheral edges of said substrates, and wherein said bonded substrates define a fluid holding cavity therebetween, one of said substrates having a reflective face and the other of said substrates having a slip-resistant face, wherein, at least in said expanded configuration, said pad is sufficiently heavy to compress tissue underlying said pad for isolating said tissue from a surgical field during surgery.

**31.** A compression pad for laparoscopic and thorascopic surgery for eliminating tissue obstructions from a surgical field within a body cavity of a patient, said pad being capable of reversibly assuming at least two configurations; one of said at least two configurations being a contracted configuration in which said pad fits within and passes through an access tube inserted into a body cavity, and the other of said at least two configurations being an expanded configuration in which said pad cannot fit within or pass through said tube, wherein said pad comprises two flexible substrates bonded together at transversely spaced apart, elongate regions interrupted by channels, and at peripheral edges of said substrates, and wherein said bonded substrates define a fluid holding cavity therebetween, said pad comprising fasteners on surfaces that oppose each other when said pad is in said contracted configuration, said fasteners being adapted to reversibly engage each other to reversibly maintain said pad in said contracted configuration, wherein, at least in said expanded configuration, said pad is sufficiently heavy to compress tissue underlying said pad for isolating said tissue from a surgical field during surgery.

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